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Lin

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(54) **NETWORK MANAGING METHOD AND DEVICE FOR WIRELESS NETWORK SYSTEM**

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H04W 64/00 (2009.01)
G01S 5/14 (2006.01)

(52) **U.S. Cl.**
CPC ***H04W 24/02*** (2013.01); ***G01S 5/14*** (2013.01); ***H04W 64/00*** (2013.01)

(58) **Field of Classification Search**
None
See application file for complete search history.

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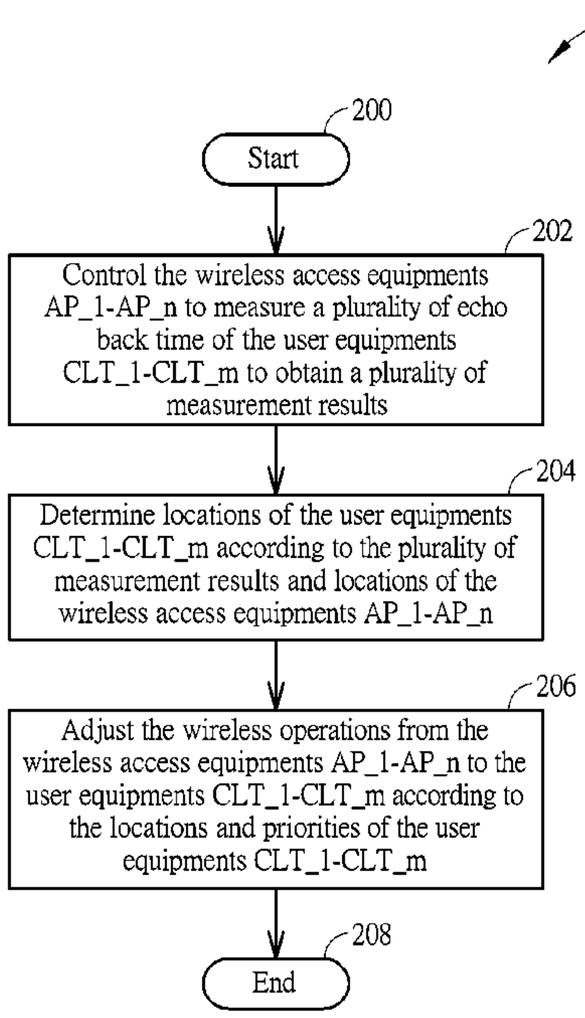
(57) **ABSTRACT**

A network managing method is utilized for a wireless network system. The wireless network includes multiple wireless access equipments and multiple user equipments. The method uses the wireless access equipments to measure a plurality of echo back time of the user equipments to obtain multiple measurement results, determines locations of the user equipments according to the measurement results and locations of the wireless access equipments, and adjusts wireless operations from the wireless access equipments to the user equipments according to the locations and priorities of the user equipments.

18 Claims, 9 Drawing Sheets



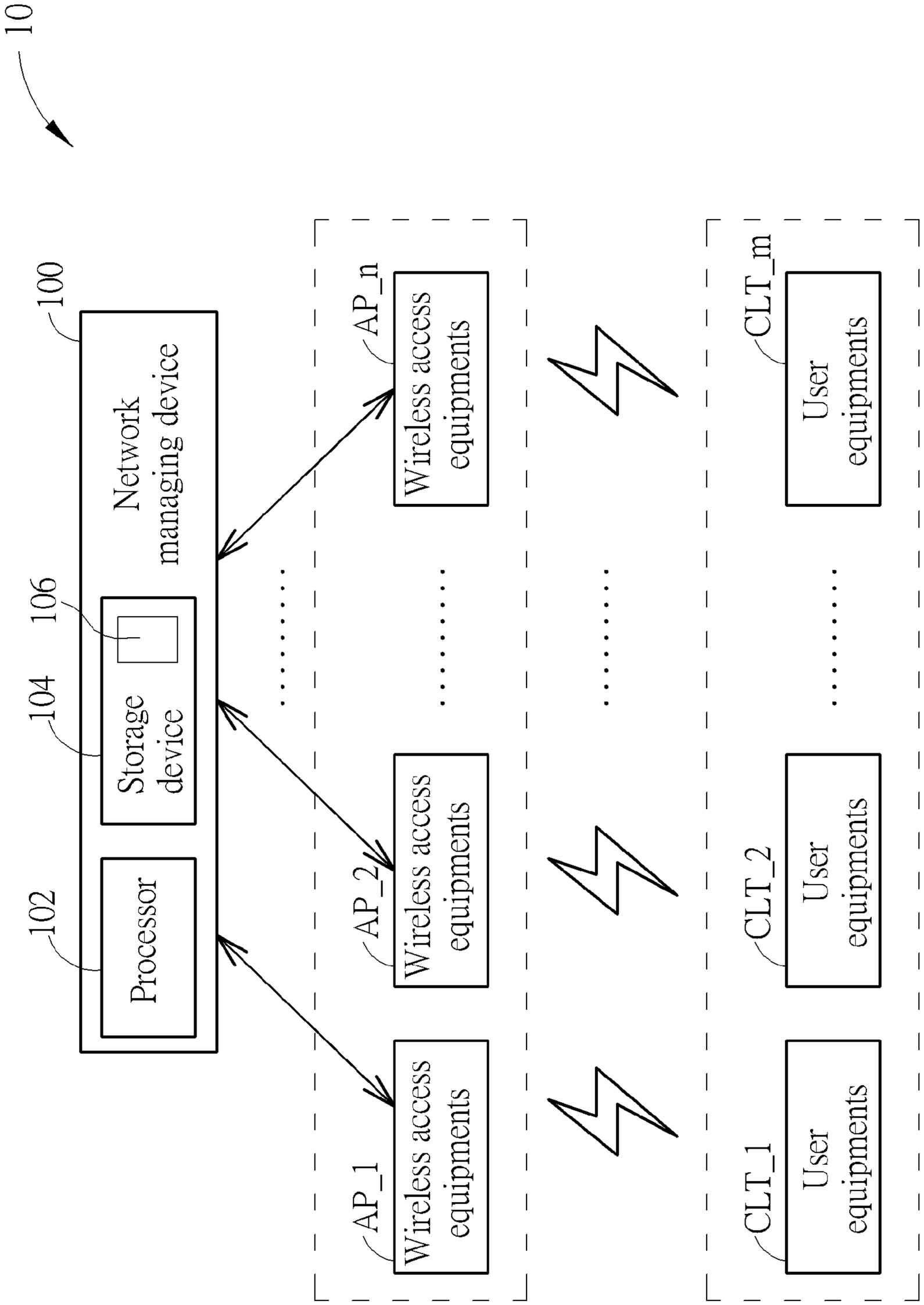

10
100
Network managing device
102
Processor
104
Storage device
106
AP_1
Wireless access equipments
AP_2
Wireless access equipments
AP_n
Wireless access equipments
CLT_1
User equipments
CLT_2
User equipments
CLT_m
User equipments

FIG. 1

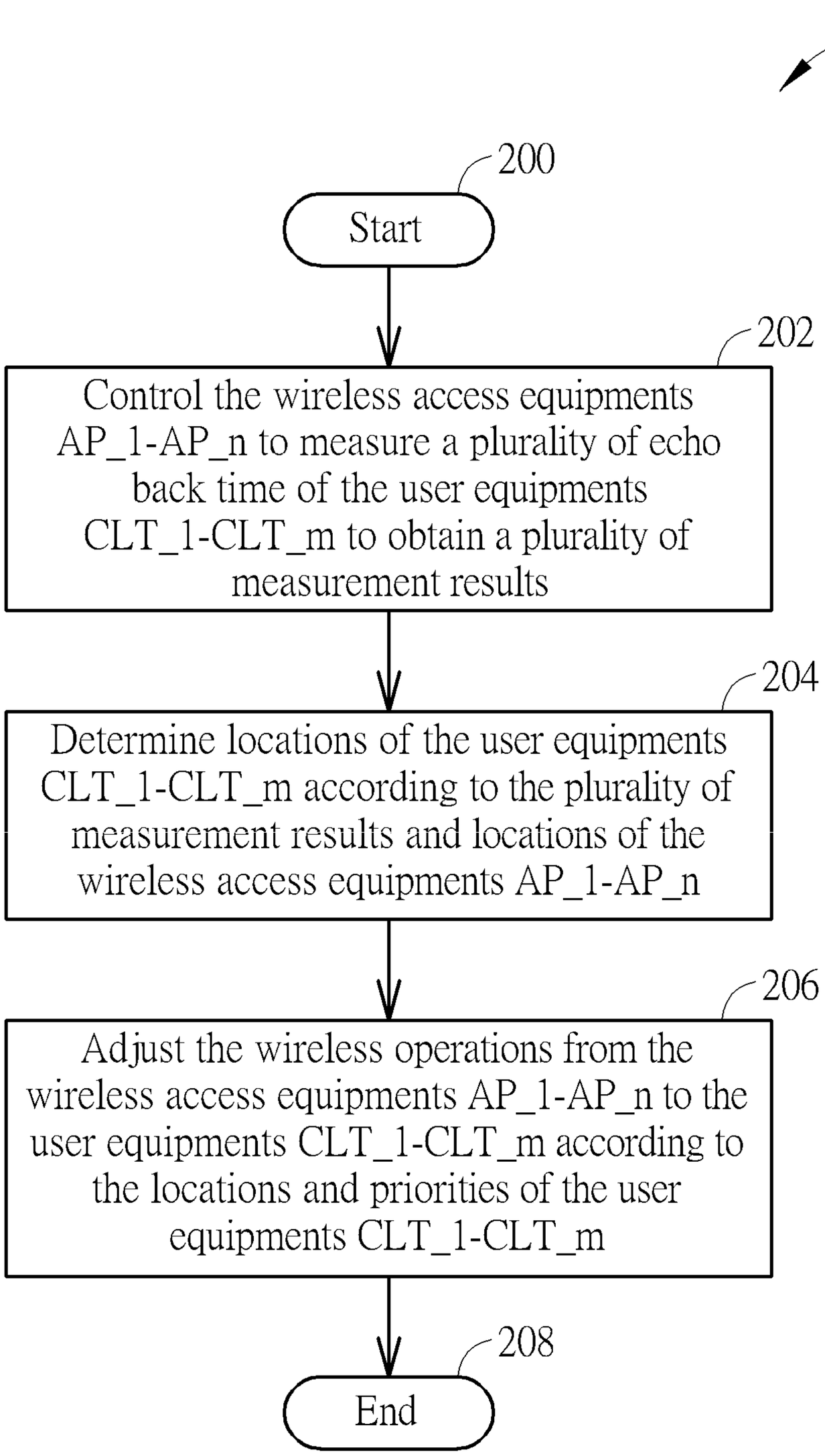

20
200
Start
202
Control the wireless access equipments AP_1-AP_n to measure a plurality of echo back time of the user equipments CLT_1-CLT_m to obtain a plurality of measurement results
204
Determine locations of the user equipments CLT_1-CLT_m according to the plurality of measurement results and locations of the wireless access equipments AP_1-AP_n
206
Adjust the wireless operations from the wireless access equipments AP_1-AP_n to the user equipments CLT_1-CLT_m according to the locations and priorities of the user equipments CLT_1-CLT_m
208
End

FIG. 2

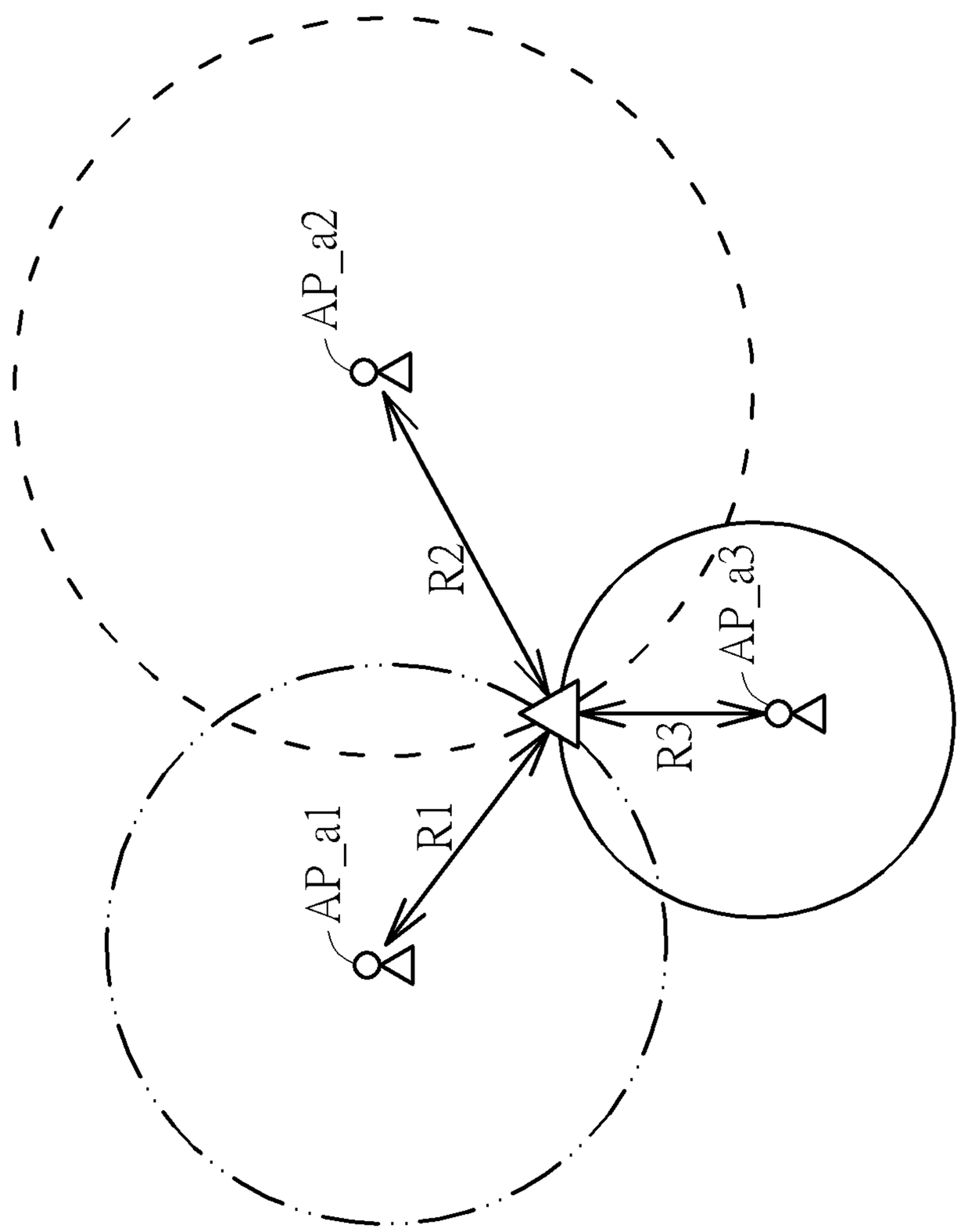


FIG. 3

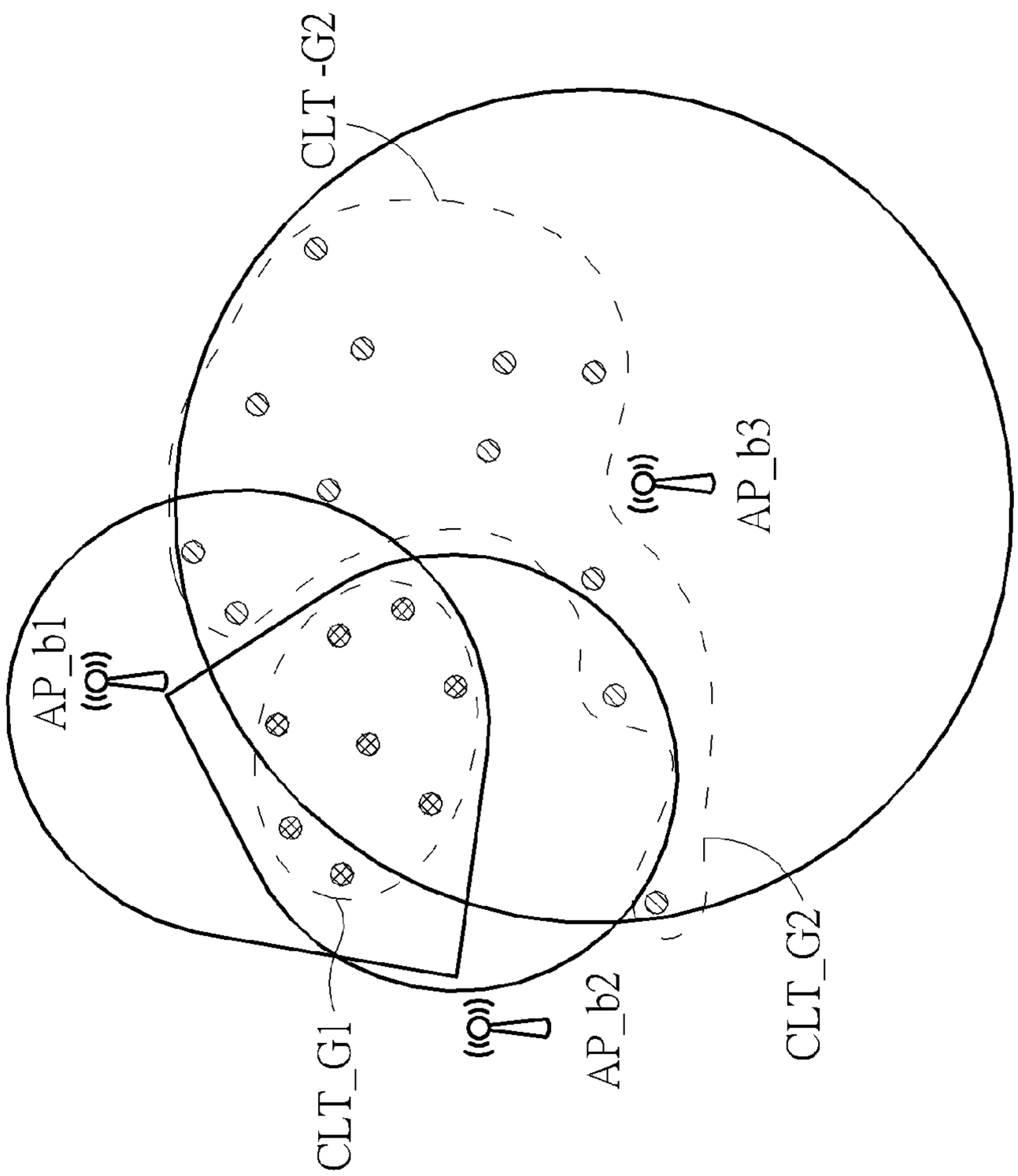


FIG. 4

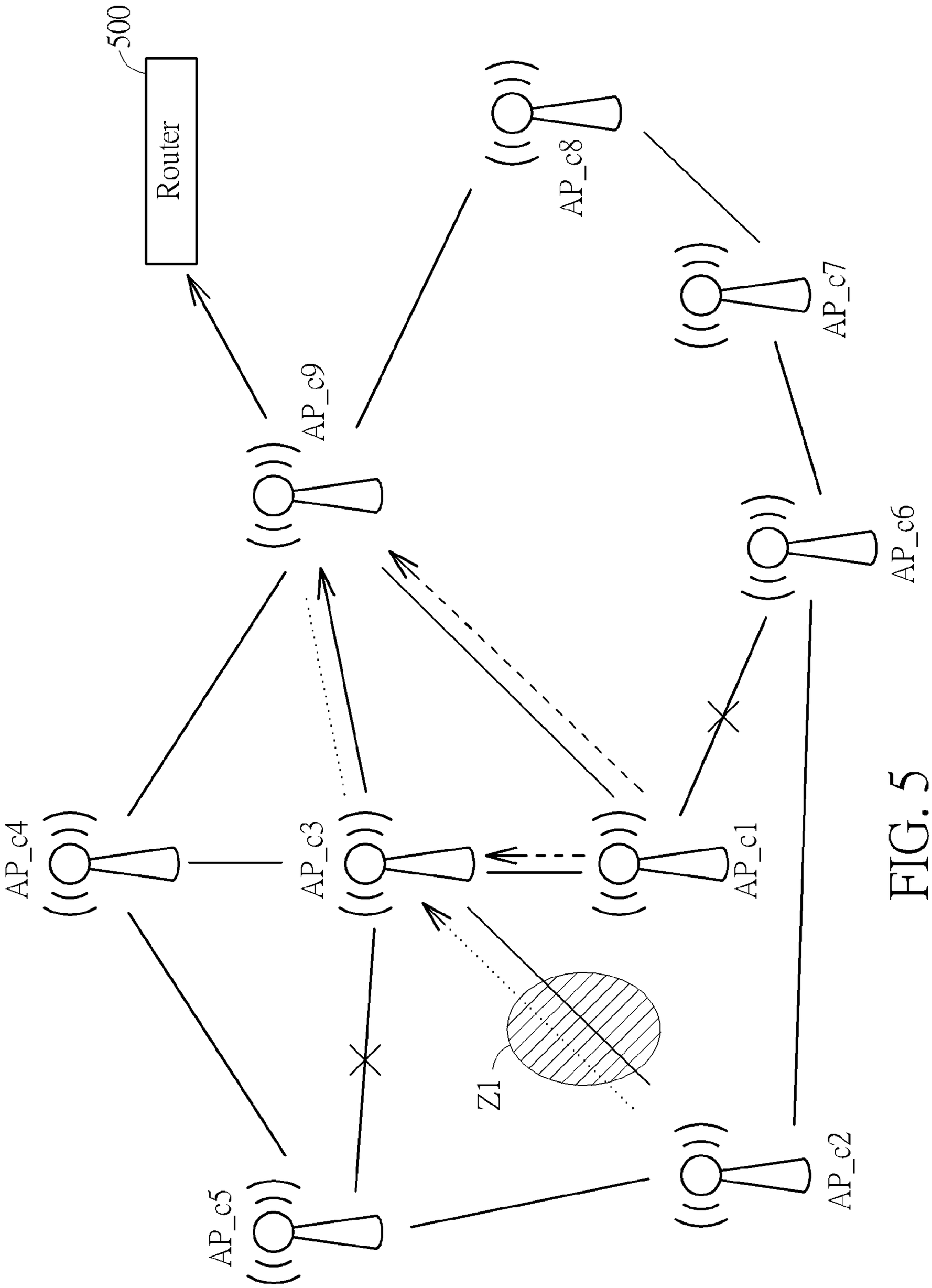


FIG. 5

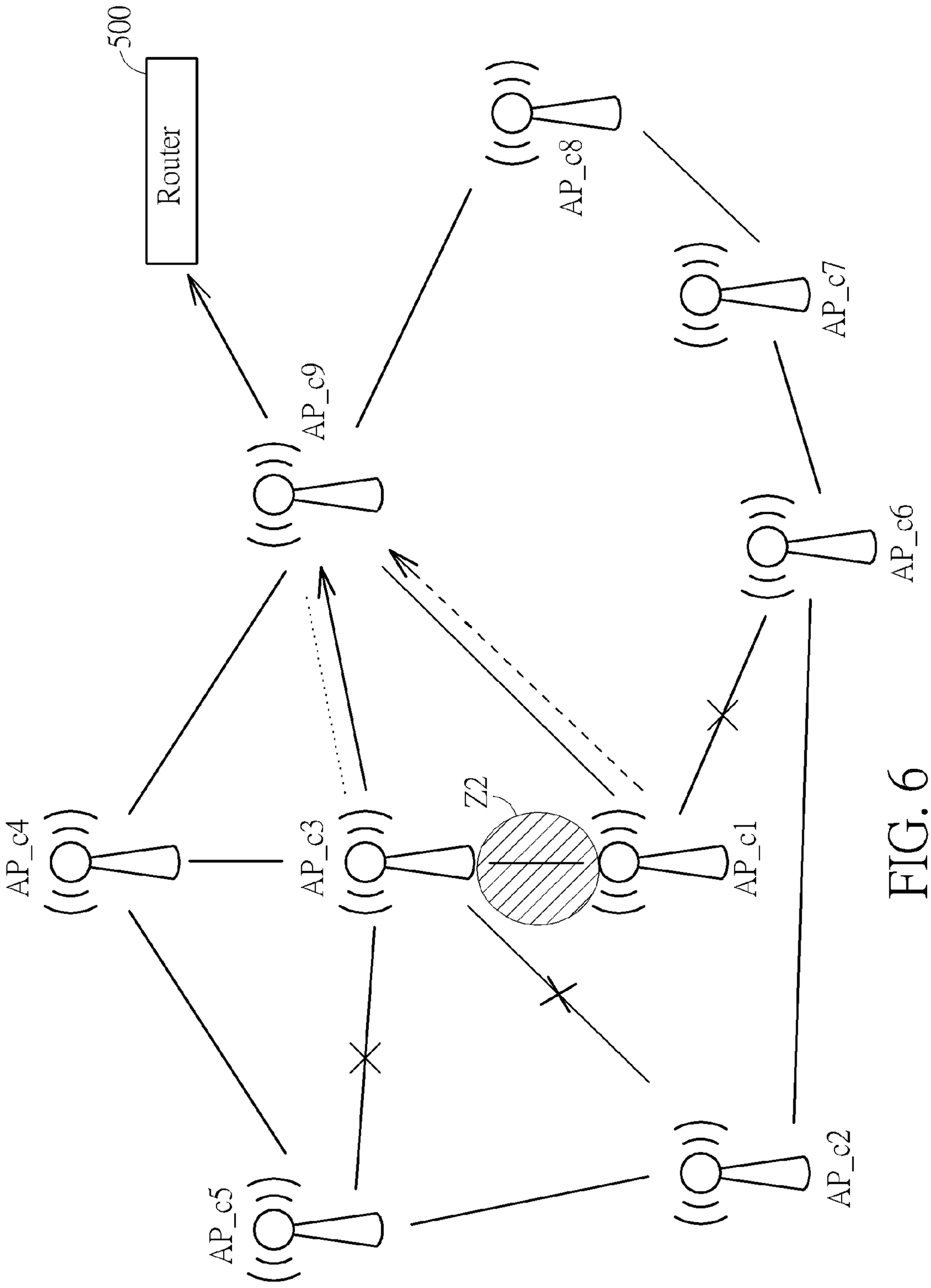


FIG. 6

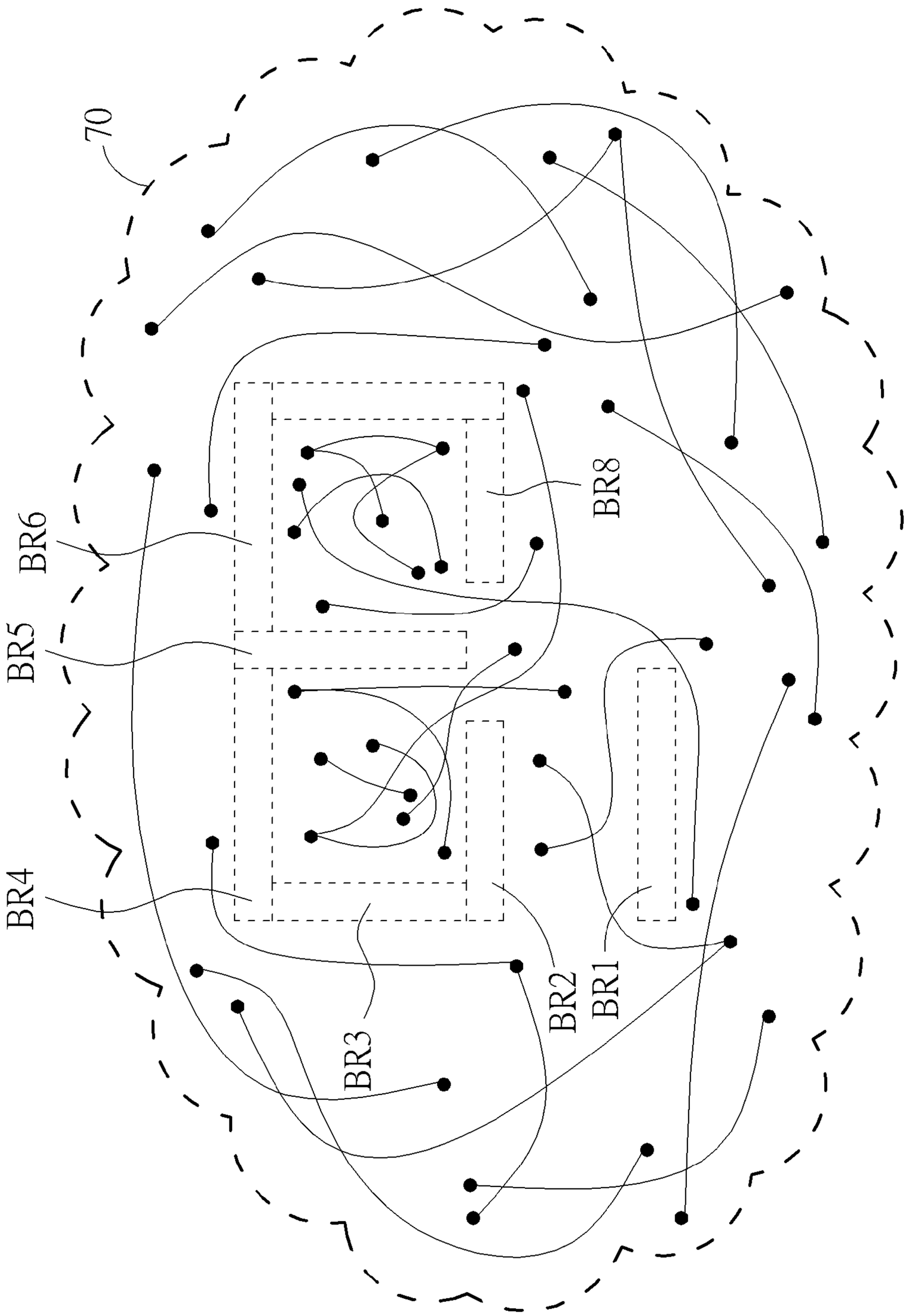


FIG. 7A

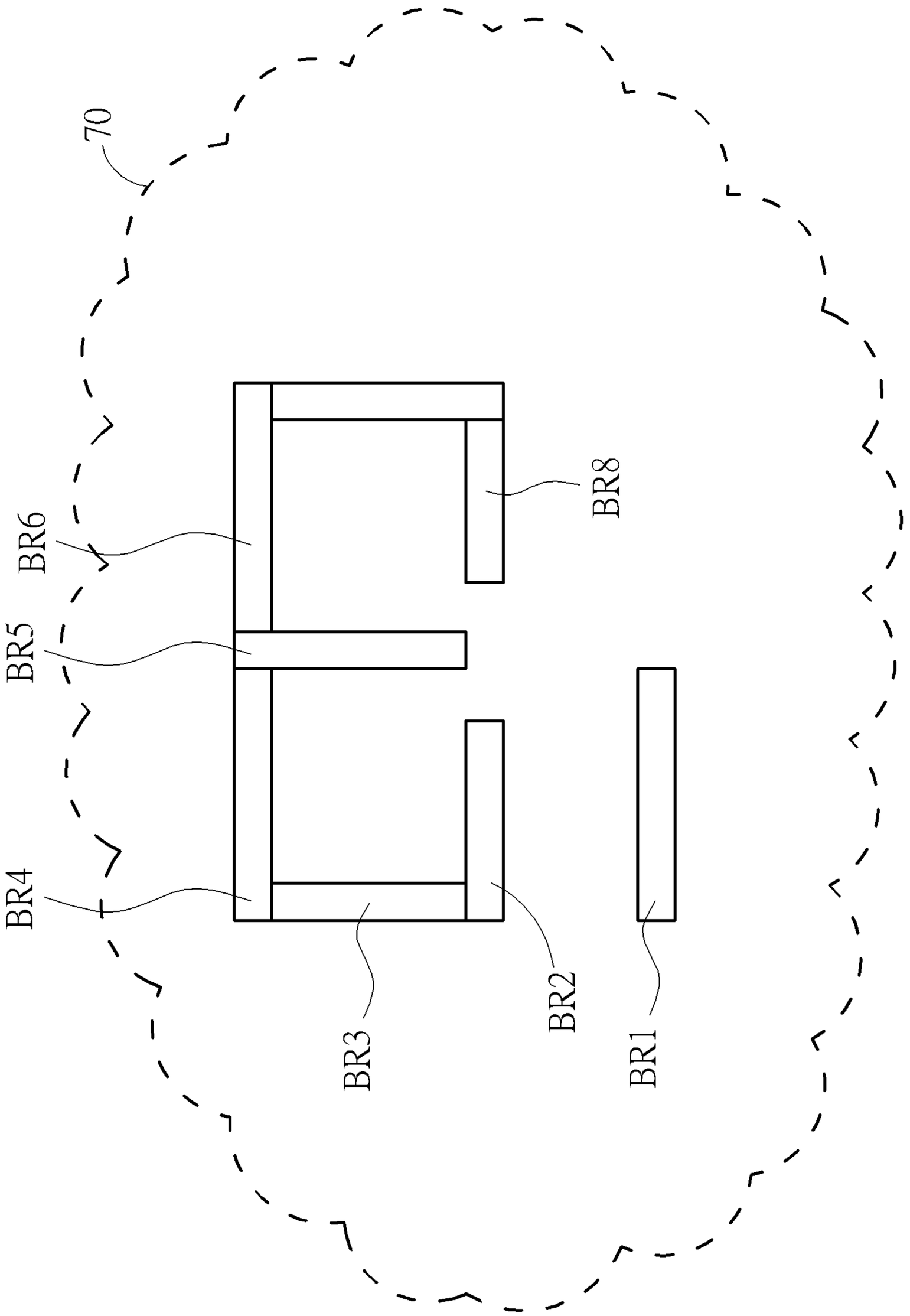


FIG. 7B

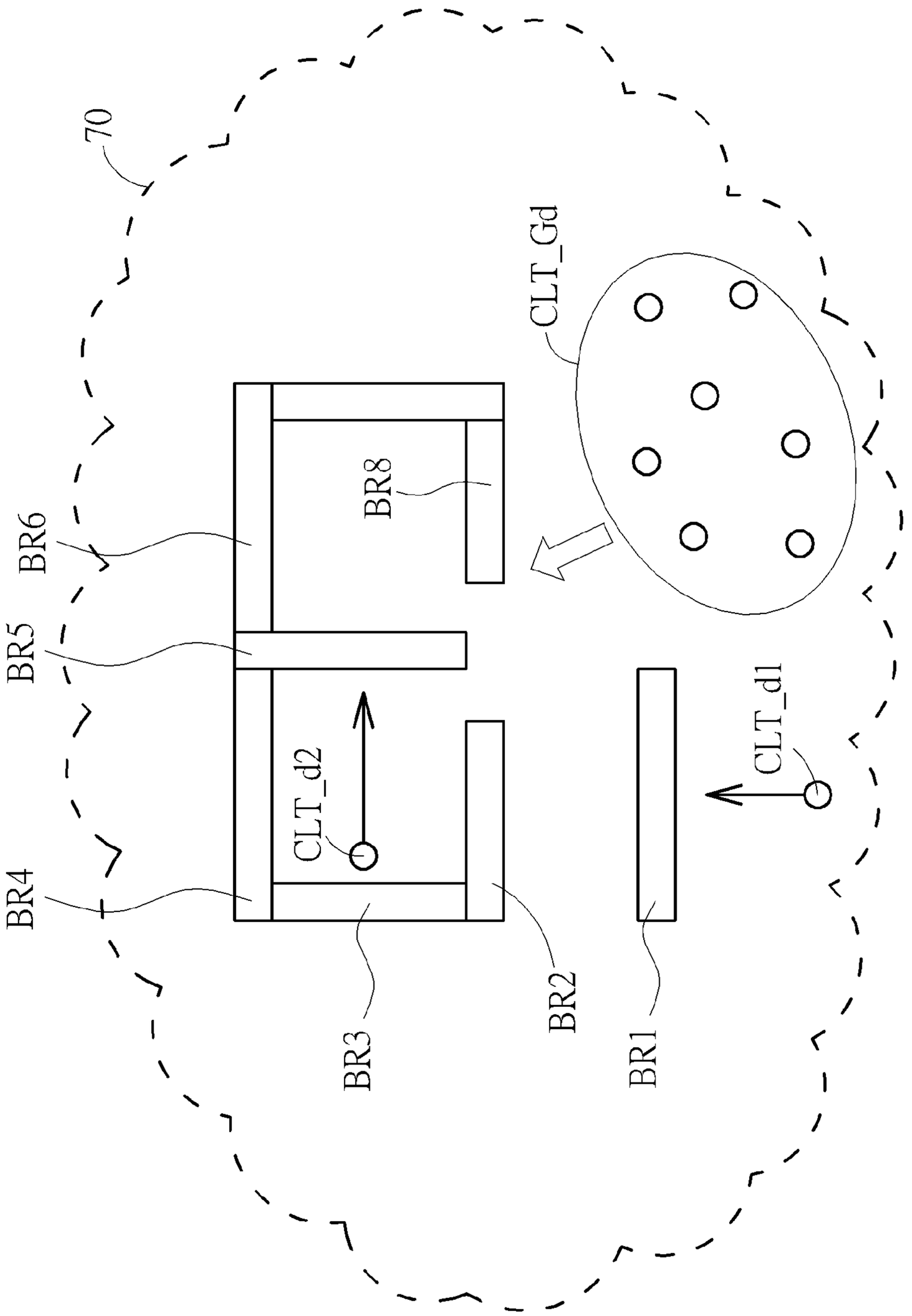


FIG. 7C

NETWORK MANAGING METHOD AND DEVICE FOR WIRELESS NETWORK SYSTEM

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a network managing method and a network managing device for a wireless network system, and more particularly, to a network managing method and a network managing device capable of adaptively providing wireless services for user equipments in a wireless network system to provide a convenient network environment.

2. Description of the Prior Art

With advances in wireless communication technology, a portable wireless device, such as a notebook, a personal digital assistant (PDA), a tablet, a smart phone, etc., has become an essential device for people in work or in life, and a user may simultaneously carry or use multiple potable wireless devices. Under such a condition, how to manage operations of the multiple portable wireless devices in a wireless network system becomes one of the industry goals.

SUMMARY OF THE INVENTION

It is therefore an objective of the present invention to provide a network managing method and a network managing device for a wireless network system to improve disadvantages of the prior art, so as to provide a convenient network environment.

The present invention discloses a network managing method for a wireless network system, wherein the wireless network system comprises a plurality of wireless access equipments and at least one user equipment. The network managing method comprises the plurality of wireless access equipments measuring a plurality of echo back time of the at least one user equipment to obtain a plurality of measurement results; determining locations of the at least one user equipment according to the plurality of measurement results and locations of the plurality of wireless access equipments; and adjusting wireless operations from the plurality of wireless access equipments to the at least one user equipment according to the locations and priorities of the at least one user equipment.

The present invention further discloses a network managing device for a wireless network system, wherein the wireless network system comprises a plurality of wireless access equipments and at least one user equipment. The network managing device comprises a processor; and a memory for storing a program code to manage the wireless network system, wherein the program code instructs the processor to perform following steps: controlling the plurality of wireless access equipments to measure a plurality of echo back time of the at least one user equipment to obtain a plurality of measurement results; determining locations of the at least one user equipment according to the plurality of measurement results and locations of the plurality of wireless access equipments; and adjusting wireless operations from the plurality of wireless access equipments to the at least one user equipment according to the locations and priorities of the at least one user equipment.

These and other objectives of the present invention will no doubt become obvious to those of ordinary skill in the art after reading the following detailed description of the preferred embodiment that is illustrated in the various figures and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a schematic diagram of a wireless network system according to an embodiment of the present invention.

FIG. **2** is a schematic diagram of a network managing process according to an embodiment of the present invention.

FIG. **3** is a schematic diagram of a principle of a triangulation method utilized for the network managing process in FIG. **2**.

FIG. **4** to FIG. **7**C are schematic diagrams of operating situations of the wireless network system in FIG. **1**.

DETAILED DESCRIPTION

Please refer to FIG. **1**, which is a schematic diagram of a wireless network system **10** according to an embodiment of the present invention. The wireless network system **10** includes wireless access equipments AP_**1**-AP_n, user equipments CLT_**1**-CLT_m, and a network managing device **100**. The wireless access equipments AP_**1**-AP_n may be access points adapted to a wireless network and are not limited hereinafter. The wireless access equipments AP_**1**-AP_n may perform data exchanges with the user equipments CLT_**1**-CLT_m by a wireless transmission method, such that the user equipments CLT_**1**-CLT_m may access an Intranet, Internet, etc. The network managing device **100** includes a processor **102** and a storage device **104**. The processor **102** may be a microprocessor or an application-specific integrated circuit (ASIC). The storage device **104** may be any one data storage device. For example, the storage device **104** may be a read-only memory (ROM), a random-access memory (RAM), a CD-ROMs, a magnetic tapes, a floppy disks, an optical data storage devices, etc., which is not limited hereinafter. Additionally, a program code **106** is stored in the storage device **104** to instruct the processor **102** to receive echo back time measured by the wireless access equipments AP_**1**-AP_n and to control wireless operations of the wireless access equipments AP_**1**-AP_n accordingly.

Specifically, please refer to FIG. **2**, which is a schematic diagram of a network managing process **20** according to an embodiment of the present invention. In the embodiment, the network managing process **20** is performed in the network managing device **100** in FIG. **1** and the network managing process **20** may be compiled as the program code **106**, which is stored in the storage device **104** to control the processor **102** to perform the network managing process **20**. As shown in FIG. **2**, the network managing process **20** includes the following steps:

Step **200**: start.

Step **202**: control the wireless access equipments AP_**1**-AP_n to measure a plurality of echo back time of the user equipments CLT_**1**-CLT_m to obtain a plurality of measurement results.

Step **204**: determine locations of the user equipments CLT_**1**-CLT_m according to the plurality of measurement results and locations of the wireless access equipments AP_**1**-AP_n.

Step **206**: adjust the wireless operations from the wireless access equipments AP_**1**-AP_n to the user equipments CLT_**1**-CLT_m according to the locations and priorities of the user equipments CLT_**1**-CLT_m.

Step **208**: end.

Thus, according to the network managing process **20**, the network managing device **100** controls the wireless access equipments AP_**1**-AP_n to measure the plurality of echo back time of the user equipments CLT_**1**-CLT_m to accordingly determine the locations of the user equipments CLT_**1**-CLT_m. Then, the network managing device **100** adjusts the wireless operations from the wireless access equipments AP_**1**-AP_n to the user equipments CLT_**1**-CLT_m based on both the priorities and the locations of the user equipments CLT_**1**-CLT_m. Under such a situation, the wireless access equipments AP_**1**-AP_n may provide proper wireless services for the user equipments CLT_**1**-CLT_m according to the locations and the priorities of the user equipments CLT_**1**-CLT_m.

In detail, in step **202**, the plurality of echo back time of the user equipments CLT_**1**-CLT_m measured by the wireless access equipments AP_**1**-AP_n may be periods between the wireless access equipments AP_**1**-AP_n outputting beacons to the user equipments CLT_**1**-CLT_m and the wireless access equipments AP_**1**-AP_n receiving response signals corresponding to the beacons from the user equipments CLT_**1**-CLT_m. In other words, since a required time of a signal transmission is related to a distance between a transmitter and a receiver, the network managing device **100** may determine the distances from each user equipment to corresponding neighbor wireless access equipments according to the plurality of echo back time of the user equipments CLT_**1**-CLT_m to obtain the locations of the user equipments CLT_**1**-CLT_m by utilizing a triangulation method in step **204**.

The principle of the triangulation method is shown in FIG. **3**. A user equipment CLT_a may receive the beacons respectively outputted from the wireless access equipments AP_a**1**, AP_a**2**, and AP_a**3**, and then the user equipment CLT_a outputs the response signals to the wireless access equipments AP_a**1**, AP_a**2**, and AP_a**3**. When the wireless access device AP_a**1** outputs the beacon to the user equipment CLT_a and receives the corresponding response signal from the user equipment CLT_a, the wireless access device AP_a**1** may obtain the echo back time of the user equipment CLT_a, which is related to the location of the user equipment CLT_a. Then, the network managing device **100** may determine that the user equipment CLT_a is roughly located on a circle with a center at the wireless access equipment AP_a**1** and with a radius R**1**. Accordingly, the network managing device **100** may also determine that the user equipment CLT_a is roughly located on a circle with a center at the wireless access equipment AP_a**2** and with a radius R**2**, and on a circle with a center at the wireless access equipment AP_a**3** and with a radius R**3**. Thus, the network managing device **100** may determine that the user equipment CLT_a is roughly located at an intersectional point of the circles with the radiuses R**1**, R**2**, and R**3**, and the network managing device **100** may determine the location of the user equipment CLT_a according to the locations of the wireless access equipments AP_a**1**, AP_a**2**, and AP_a**3**.

Notably, FIG. **3** is utilized for explaining the principle of the triangulation method and is not to limit the scope of the present invention. For example, the network managing device **100** is not limited to determine the location of the user equipment by utilizing three wireless access equipments, and the network managing device **100** may also determine the location of the user equipment by utilizing more than three wireless access equipments to enhance the accuracy of determination.

Next, in step **206**, after the network managing device **100** determines the locations of the user equipments CLT_**1**-CLT_m, the network managing device **100** further adjusts the wireless operations of the wireless access equipments AP_**1**-AP_n according to the priorities of the user equipments CLT_**1**-CLT_m, such as adjusting beam-forming methods and mesh routing methods of the wireless access equipments AP_**1**-AP_n.

For example, in an embodiment, as shown in FIG. **4**, wireless access equipments AP_b**1**, AP_b**2**, and AP_b**3** in the wireless access equipments AP_**1**-APn provide the wireless services for user equipment groups CLT_G**1** and CLT_G**2** of the user equipments CLT_**1**-CLT_m, and a priority of the user equipment group CLT_G**1** is greater than a predefined degree or greater than a priority of the user equipment group CLT_G**2**. Then, according to the embodiment of the present invention, the network managing device **100** may control the wireless access equipments AP_b**1** and AP_b**2** to adjust the beam-forming methods according to the location of the user equipment group CLT_G**1**, such that the wireless signal beams of the wireless access equipments AP_b**1** and AP_b**2** may substantially point toward the user equipment group CLT_G**1** to prioritize providing the wireless services for the user equipment group CLT_G**1**. In addition, the network managing device **100** controls the wireless access equipments AP_b**3** to maintain the wireless operation with all directions to ensure normal operations of wireless communication.

In another embodiment, the network managing device **100** may further adjust the mesh routing methods of the wireless access equipments AP_**1**-AP_n. As shown in FIG. **5**, for simplicity, only the wireless access equipments AP_c**1**-AP_c**9** in the wireless access equipments AP_**1**-AP_n are described in FIG. **5**. The wireless access equipments AP_c**1**-AP_c**9** are connected to a router **500** of an external network, and a user equipment with higher priority is in a region Z**1**. Thus, the network managing device **100** adjusts the beam-forming methods of the wireless access equipments AP_c**1** and AP_c**2** to prioritize providing the wireless services for the user equipment in the region Z**1**. Additionally, for ensuring that the user equipment in the region Z**1** may preferentially perform data exchanges via the router **500**, the network managing device **100** further increases the routing priority of the path from the wireless access equipment AP_c**1** to the wireless access equipment AP_c**9** (i.e. the dashed line path in FIG. **5**) and the path from the wireless access equipment AP_c**2** through the wireless access equipment AP_c**3** to the wireless access equipment AP_c**9** (i.e. the dotted line path in FIG. **5**). Moreover, the path from the wireless access equipment AP_c**6** to the wireless access equipment AP_c**1** and the path from the wireless access equipment AP_c**5** to the wireless access equipment AP_c**3** may be temporally forbade. Thereby, the wireless access equipment AP_c**1** and AP_c**2** may ensure to prioritize performing signal exchanges with the wireless access equipment AP_c**9**, such that the user equipment in the region Z**1** may preferentially perform the data exchanges by the router **200**. On the other sides, controlling the wireless access equipment AP_c**4** to connect to the wireless access equipment AP_c**9** only through the wireless access equipment AP_c**3**, or allowing the wireless access equipment AP_c**4** to directly connect to the wireless access equipment AP_c**9** under specific applications may also facilitate the wireless access equipments AP_c**1** and AP_c**2** to prioritize providing the wireless services for the user equipment in the region Z**1**.

Notably, the mesh routing adjustment in FIG. **5** is utilized for ensuring that the wireless access equipments AP_c**1** and AP_c**2** may prioritize providing the wireless services for the user equipment in the region Z**1**, which is not limited hereinafter. For example, in another embodiment, in addition to directly connect to the wireless access equipment AP_c**9**, the

wireless access equipment AP_c**1** may also connect to the wireless access equipment AP_c**9** through the wireless access equipment AP_c**3**, and the wireless access equipment AP_c**3** is configured to prioritize performing the signals from the wireless access equipments AP_c**1** and AP_c**2**. In addition, the wireless access equipment AP_c**4** may also be controlled to connect to the wireless access equipment AP_c**3**. All of the above belong to the scope of the present invention.

Furthermore, please refer to FIG. **6**, if the user equipment in the region Z**1** moves toward a region Z**2**, according to the embodiment of the present invention, since the wireless access equipment AP_c**3** is close to the region Z**2**, the network managing device **100** may control the wireless access equipment AP_c**3** instead of the wireless access equipment AP_c**2** to prioritize providing the wireless services for the user equipment in the region Z**2** according to the movements of the user equipment. Additionally, the network managing device **100** may also adjust the beam-forming methods of the wireless access equipments AP_c**1** and AP_c**3** to adjust the wireless signal beams of the wireless access equipments AP_c**1** and AP_c**3** to substantially point toward the region Z**2**. Under such a situation, for ensuring that the user equipment in the region Z**2** may preferentially perform the data exchanges by the router **200**, the network managing device **100** may further increase the routing priority of the path from the wireless access equipment AP_c**1** to the wireless access equipment AP_c**9** (i.e. the dashed line path in FIG. **6**) and the path from the wireless access equipment AP_c**3** to the wireless access equipment AP_c**9** (i.e. the dotted line path in FIG. **6**). Additionally, the path from the wireless access equipment AP_c**6** to the wireless access equipment AP_c**1**, the path from the wireless access equipment AP_c**2** to the wireless access equipment AP_c**3**, and the path from the wireless access equipment AP_c**5** to the wireless access equipment AP_c**3** may also be temporally forbade. Thereby, the wireless access equipments AP_c**1** and AP_c**3** may ensure to prioritize performing signals exchanges with the wireless access equipment AP_c**9**, such that the user equipment in the region Z**2** may preferentially perform the data exchanges by the router **200**.

In the above embodiment, the network managing device **100** determines the locations or the movement situations of the user equipments CLT_**1**-CLT_m according to the echo back time measured by the wireless access equipments AP_**1**-AP_n. Then, the network managing device **100** accordingly adjusts the wireless operations of the wireless access equipments AP_**1**-AP_n to prioritize providing the wireless services for the user equipment with higher priority. However, in addition to adjust the wireless operations of the wireless access equipments AP_**1**-AP_n passively according to the movement situations, the network managing device **100** of the present invention may also actively adjust the wireless operations of the wireless access equipments AP_**1**-AP_n in other embodiments. That is, when the network managing device **100** detects that the user equipment, which is required to be preferentially serviced, moves from a region to another region, the network managing device **100** may previously adjust the wireless operations of the wireless access equipments AP_**1**-AP_n to deal with the movement situation of the user equipment. The detecting methods may be based on the movement of the user equipment (such as the moving speed or the moving direction, etc.) or based on a predefined path configuration data.

For example, as shown in FIG. **5** and FIG. **6**, if the network managing device **100** determines that the user equipment in the region Z**1** starts moving to the region Z**2** according to the measurement results of the wireless access equipments AP_**1**-AP_n, the network managing device **100** may previously adjust the wireless operations of the wireless access equipments AP_c**1**-AP_c**9** to be the situation in FIG. **6**. Moreover, if a path configuration data indicates that the user equipment in the region Z**1** is scheduled to move to the region Z**2** at a specific time, the network managing device **100** may adjust the wireless operations of the wireless access equipments AP_c**1**-AP_c**9** to be the situations in FIG. **6** before or just at the specific time. As a result, the network managing device **100** may previously adjust the wireless operations of the wireless access equipments AP_c**1**-AP_c**9** according to the possible movement situations of the user equipment to improve the network efficiency.

On the other hands, in the wireless network system **10**, with a continuous increase of the obtained movement situations of the user equipments CLT_**1**-CLT_m, the network managing device **100** may accordingly determine building shields in a signal coverage of the wireless network system **10** to further adjust the wireless operations of the wireless access equipments AP_**1**-AP_n. For example, please refer to FIG. **7**A, which is a schematic diagram of a signal coverage **70** of the wireless network system **10**. In FIG. **7**A, the solid lines represent the movement situations of the user equipments CLT_**1**-CLT_m, which are statistically analyzed by the network managing device **100** and are the normal moving situations of the user equipments CLT_**1**-CLT_m in the signal coverage **70**. The network managing device **100** may analyze the movement types of the user equipments CLT_**1**-CLT_m (such as to avoid or to bypass some certain regions) according to the normal moving situations of the user equipments CLT_**1**-CLT_m, so as to determine building shields BR**1**-BR**8** in the signal coverage **70**, i.e. shown in FIG. **7**B. When the building shields BR**1**-BR**8** are determined, the network managing device **100** further determines moving trends of the user equipments CLT_**1**-CLT_m accordingly to adjust the wireless operations of the wireless access equipments AP_**1**-AP_n. For example, in FIG. **7**C, if a user equipment CLT_d**1** with higher priority move toward the building shield BR**1**, the network device **100** may determine that the user equipment CLT_d**1** may bypass the building shield BR**1**, and the wireless signal beams are not required to be adjusted to point to the building shield BR**1**. If another user equipment CLT_d**2** with higher priority is located in a region surrounded by the building shield BR**2**-BR**5**, the network device **100** may determine that the user equipment CLT_d**2** may stay in the region or move to an outside of the region from the gap between the building shield BR**2** and BR**5**, and the network device **100** may prepare for the two situations in advance. Furthermore, if a user equipment group CLT_Gd with higher priority moves to a region surrounded by the building shields BR**5**-BR**8** at a specific time, the network managing device **100** determines that the user equipment group CLT_Gd may only move into the region surrounded by the building shields BR**5**-BR**8** from the gap between the building shield BR**5** and BR**7**, and the network device **100** may prepare for the movement situation in advance.

As can be seen, the embodiments of the present invention may determine the locations or the movement types of the user equipments CLT_**1**-CLT_m according to the echo back time measured by the wireless access equipments AP_**1**-AP_n to actively or passively adjust the wireless operations of the wireless access equipments AP_**1**-AP_n for the specific user equipments with higher priority. Notably, the above embodiments are utilized for explaining the present invention, and any alternations according to the above embodiments all belong to the scopes of the present invention. For example, the determination of the echo back time is not lim-

ited by the beacons and the corresponding response signals. Packages or signals of other types may also be utilized in the present invention for the determination of the echo back time, which are not limited hereinafter. In general, the beacons are periodically outputted from the wireless access equipments AP_**1**-AP_n to determine whether the wireless connections are normally working. In one embodiment, the network managing device **100** may also control the wireless access equipments AP_**1**-AP_n to output the specific packages for accordingly determining the echo back time and the locations of user equipments. Furthermore, the number n of the wireless access equipments AP_**1**-AP_n is required to be greater than or equal to 3 to correctly perform the triangulation method, and the network device **100** may previously obtain the locations of the wireless access equipments AP_**1**-AP_n. In addition to adjusting the beam-forming methods and the mesh routing methods of the wireless access equipments AP_**1**-AP_n, the network device **100** may also prioritize providing the wireless services for the specific user equipments by adjusting the operating powers of the wireless access equipments AP_**1**-AP_n or by other methods, etc.

On the other hands, the determining or configuring methods of the priority are also not limited to specific rules. For example, in one embodiment, a priority configuration table may be previously stored in the storage device **104** of the network managing device **100** to record the media access control (MAC) addresses and the priorities of the specific user equipments. When any user equipment moves into the signal coverage of the wireless network system **10** to establish the connections with the specific wireless access equipments, the network managing device **100** may determine the priority of the user equipment according to the priority configuration table. Moreover, in another embodiment, the priorities may also be related to the locations of the regions; that is, the network managing device **100** may control the wireless access equipments AP_**1**-AP_n to prioritize providing the wireless services for the user equipment located in the specific region. All of the above belong to the scope of the present invention.

The prior art may not adaptively provide the wireless services for the user equipments with different priorities. In comparison, the present invention may actively or passively provide the proper wireless services according to the locations, the priorities, or the movement types, etc. to provide a convenient network environment.

Those skilled in the art will readily observe that numerous modifications and alterations of the device and method may be made while retaining the teachings of the invention. Accordingly, the above disclosure should be construed as limited only by the metes and bounds of the appended claims.

What is claimed is:

1. A network managing method for a wireless network system, wherein the wireless network system comprises a plurality of wireless access equipments and a plurality of user equipments, the network managing method comprising:

measuring, by the plurality of wireless access equipments, a plurality of echo back time of the plurality of user equipments to obtain a plurality of measurement results;

determining locations of the plurality of user equipments according to the plurality of measurement results and locations of the plurality of wireless access equipments; and

adjusting wireless operations from the plurality of wireless access equipments to the plurality of user equipments according to the locations and priorities of the plurality of user equipments.

2. The network managing method of claim **1**, wherein a number of the plurality of wireless access equipments is greater than or equal to 3.

3. The network managing method of claim **1**, wherein the plurality of echo back time are periods between the plurality of wireless access equipments outputting a plurality of beacons to the plurality of user equipments and the plurality of wireless access equipments receiving a plurality of response signals corresponding to the plurality of beacons from the plurality of user equipments.

4. The network managing method of claim **1**, wherein adjusting the wireless operations from the plurality of wireless access equipments to the plurality of user equipments comprises adjusting beam forming methods and mesh routing methods of the plurality of wireless access equipments for the plurality of user equipments.

5. The network managing method of claim **1**, wherein the step of adjusting the wireless operations from the plurality of wireless access equipments to the plurality of user equipments according to the locations and the priorities of the plurality of user equipments comprises:

controlling the plurality of wireless access equipments to prioritize providing wireless services for a user equipment of the plurality of user equipments when a priority of the user equipment is greater than a predefined degree.

6. The network managing method of claim **1**, further comprising:

determining movement situations of the plurality of user equipments according to the plurality of measurement results; and

adjusting the wireless operations from the plurality of wireless access equipments to the plurality of user equipments according to the movement situations and the priorities of the plurality of user equipments.

7. The network managing method of claim **6**, wherein the step of adjusting the wireless operations from the plurality of wireless access equipments to the plurality of user equipments according to the movement situations and the priorities of the plurality of user equipments comprises:

controlling the plurality of wireless access equipments to prioritize providing wireless services for a user equipment of the plurality of user equipments when a priority of the user equipment is greater than a predefined degree and the user equipment moves toward a region.

8. The network managing method of claim **1**, further comprising:

receiving a path configuration data; and

adjusting the plurality of wireless access equipments to prioritize providing wireless services for a region within a period when the path configuration data indicates that the plurality of user equipments moves to the region within the period.

9. The network managing method of claim **1**, further comprising:

determining normal moving situations of the plurality of user Equipments in a signal coverage of the wireless network system according to the plurality of measurement results;

determining at least one building shield in the signal coverage according to the normal moving situations of the plurality of user equipments in the signal coverage of the wireless network system; and

determining moving trends of the plurality of user equipments according to the at least one building shield and the locations of the plurality of user equipments to adjust

the wireless operations from the plurality of wireless access equipments to the plurality of user equipments.

10. A network managing device for a wireless network system, wherein the wireless network system comprises a plurality of wireless access equipments and a plurality of user equipments, the network managing device comprising:

a processor; and

a memory for storing a program code to manage the wireless network system,

wherein the program code instructs the processor to perform following steps:

controlling the plurality of wireless access equipments to measure a plurality of echo back time of the plurality of user equipments to obtain a plurality of measurement results;

determining locations of the plurality of user equipments according to the plurality of measurement results and locations of the plurality of wireless access equipments; and

adjusting wireless operations from the plurality of wireless access equipments to the plurality of user equipments according to the locations and priorities of the plurality of user equipments.

11. The network managing device of claim **10**, wherein a number of the plurality of wireless access equipments is greater than or equal to 3.

12. The network managing device of claim **10**, wherein the plurality of echo back time are periods between the plurality of wireless access equipments outputting a plurality of beacons to the plurality of user equipments and the plurality of wireless access equipments receiving a plurality of response signals corresponding to the plurality of beacons from the plurality of user equipments.

13. The network managing device of claim **10**, wherein adjusting the wireless operations from the plurality of wireless access equipments to the plurality of user equipments comprises adjusting beam forming methods and mesh routing methods of the plurality of wireless access equipments for the plurality of user equipments.

14. The network managing device of claim **10**, wherein the step of adjusting the wireless operations from the plurality of wireless access equipments to the plurality of user equipments according to the locations and the priorities of the plurality of user equipments comprises:

controlling the plurality of wireless access equipments to prioritize providing wireless services for a user equipment of the plurality of user equipments when a priority of the user equipment is greater than a predefined degree.

15. The network managing device of claim **10**, wherein the program code indicates to the processor to further perform following step:

determining movement situations of the plurality of user equipments according to the plurality of measurement results; and

adjusting the wireless operations from the plurality of wireless access equipments to the plurality of user equipments according to the movement situations and the priorities of the plurality of user equipments.

16. The network managing device of claim **15**, wherein the step of adjusting the wireless operations from the plurality of wireless access equipments to the plurality of user equipments according to the movement situations and the priorities of the plurality of user equipments comprises:

controlling the plurality of wireless access equipments to prioritize providing wireless services for a user equipment of the plurality of user equipments when a priority of the user equipment is greater than a predefined degree and the user equipment moves toward a region.

17. The network managing device of claim **10**, wherein the program code indicates to the processor to further perform following step:

receiving a path configuration data; and

adjusting the plurality of wireless access equipments to prioritize providing wireless services for a region within a period when the path configuration data indicates that the plurality of user equipments moves to the region within the period.

18. The network managing device of claim **10**, wherein the program code indicates to the processor to further perform following step:

determining normal moving situations of the plurality of user equipments in a signal coverage of the wireless network system according to the plurality of measurement results;

determining at least one building shield in the signal coverage according to the normal moving situations of the plurality of user equipments in the signal coverage of the wireless network system; and

determining moving trends of the plurality of user equipments according to the at least one building shield and the locations of the plurality of user equipments to adjust the wireless operations from the plurality of wireless access equipments to the plurality of user equipments.

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